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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,777	12/14/2005	Stuart Michael Nevill	000035-067	7394
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EXAMINER				
PHILLIPS, FORREST M				
ART UNIT		PAPER NUMBER		
2837				
NOTIFICATION DATE		DELIVERY MODE		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

### Office Action Summary

**Application No.**

10/560,777

**Applicant(s)**

NEVILL, STUART MICHAEL

**Examiner**

FORREST M. PHILLIPS

**Art Unit**

2837

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,7,8,12,15,21,23-26,33-39 and 41-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,7,8,12,15,21,23-26,33-39 and 41-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,7-8,12,15,21,23-26,33-39,41-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over James et al. (US6862361) in view of Nevil (WO 00/78091) and Guenther.

With respect to claim 1 James discloses a diaphragm for a loudspeaker drive unit, the diaphragm comprising a block of rigid plastic foam (Column 4 lines 20-25) material having a first convex, frusto-conical sound-radiating front face and a second convex frusto-conical rear face (see figure 2), each said frusto-conical face being formed by a respective frustrum comprising a truncation plane and surrounding conical flank, wherein said block is stiffened by being bound over said first and second faces.

James does not disclose wherein the foam is stiffened by being bound over the first and second faces by a multiplicity of turns of one or more elongate members of flexible material stiffened by a stiffening composition, said flexible material being wound tangentially to said truncation planes so as to leave interstitial spaces between adjacent turns at the outer periphery of said conical flanks, in which said spaced said block of rigid plastic foam material is left uncovered by said elongate members.

Nevil discloses stiffening a flexible material of a diaphragm by using tangential turns of an elongate member of flexible material said member being wound tangentially to said truncation planes so as to leave interstitial spaces between adjacent turns at the outer periphery of said conical flanks, in which spaces said block of rigid plastic foam is left uncovered by said elongate members.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Nevil to use elongate flexible members to stiffen a diaphragm with the frusto-conical diaphragm of James to provide a stiff, easy to manufacture and lightweight diaphragm to enhance sound reproduction.

James in view of Nevil does not disclose wherein the elongate members are themselves stiffened by a stiffening composition.

Gunter discloses the use of elongate stiffening members which are flexible and stiffened by a stiffening composition in the production of a speaker diaphragm (abstract).

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Gunter to use elongate flexible members stiffened by a stiffening matrix to provide a greater degree of stiffness to the diaphragm of James as modified.

With respect to claim 7 James further discloses (Column 4 lines 20-25) wherein the foam is a foam selected from the group consisting of polymethyl methacrylamide foam and expanded polystyrene foam.

With respect to claim 8 James as modified discloses the invention as claimed except wherein the block is made of a rigid plastic foam material having a density selected from the group consisting of more than 20 grams per liter and between 28 and 35 grams per liter. It would have been obvious to select such a density as the material is disclosed and is described as light weight, further it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working range involves only routine skill in the art. In re Aller, 105 USPQ 233

With respect to claim 12 examiner considers that there are necessarily voids present in the foam as claimed.

With respect to claim 15 Nevil further discloses wherein the or each elongate member is constituted by a member selected from the group as claimed (see page 4 lines 1-5).

With respect to claim 23 Nevil further discloses wherein there is a protective rim (47 in figure 3) provided at the periphery of the diaphragm between the one or more elongate members and the material of the diaphragm. The diaphragm of James as modified being the block of foam.

With respect to claim 33 examiner considers the limitations to be demonstrated as discussed in above rejections of claims 1 and 12.

With respect to claim 24 Guenther further discloses wherein the one or more elongate members are adhesively secured directly to the material of the diaphragm (abstract).

With respect to claim 34 James further discloses (Column 4 lines 20-25) wherein the foam is a foam selected from the group consisting of polymethyl methacrylamide foam and expanded polystyrene foam.

With respect to claim 26 James further discloses wherein the diaphragm is bonded to a central tube for carrying the voice coil (26 in figure 2) of the loud speaker drive unit.

With respect to claim 35 Guenther further discloses wherein the stiffening composition comprises a composition selected from the claimed group (see abstract).

With respect to claim 36 James as modified discloses the invention as claimed except wherein the block is made of a rigid plastic foam material having a density selected from the group consisting of more than 20 grams per liter and between 28 and 35 grams per liter. It would have been obvious to select such a density as the material is disclosed and is described as light weight, further it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working range involves only routine skill in the art. In re Aller, 105 USPQ 233

With respect to claim 37 Nevil further discloses wherein the or each elongate member is constituted by a member selected from the group as claimed (see page 4 lines 1-5).

With respect to claim 38 Examine considers that James as modified discloses the invention as claimed. See rejections of claims 1, and 26. See also Nevil page 10 lines 10-17.

With respect to claim 21 Examiner considers that The number of turns is selected from the group consisting of between 100 and 500 turns, Between 100 and 400 turns, between 200 and 400 turns, and approximately 300 turns (refer to Nevil page 10 lines 10-17.

With respect to claim 25 James as modified discloses wherein said first face of the block of the material and said one or more flexible members are arranged to act directly on the ambient air to radiate sound ( the first face faces outward of a speaker fixture).

With respect to claim 39 examiner considers that there are necessarily voids present in the foam as claimed.

With respect to claim 41 Nevil further discloses wherein there is a protective rim (47 in figure 3) provided at the periphery of the diaphragm between the one or more elongate members and the material of the diaphragm. The diaphragm of James as modified being the block of foam.

With respect to claim 45 Examiner considers that as Neviln (page 10 lines 10-17) discloses about 400 turns one of ordinary skill in the art would consider this to include such numbers of turns as 399.

With respect to claim 42 James discloses a diaphragm for a loudspeaker drive unit the diaphragm comprising: a central tubular member (37 in figure 2), a circular block of rigid foam (35 in figure 2) material of lozenge-shaped cross-section surrounding said tubular member and secured thereto, said block having a first sound radiating face and a second sound radiating face.

James does not disclose a density between 25 and 35 grams per liter, a winding consisting of between 100 and 500 turns of a flexible monofilaments bundle of paraphenylene polybenzobisoxazole wound tangentially to said tubular member about said block to form a single layer at the periphery of said block leaving spaces between turns, and an adhesive stiffening composition applied to said monofilament bundle and securing said winding to said block.

Nevil discloses stiffening a flexible material of a diaphragm by using between 100 and 500 tangential turns of an elongate member of flexible material said member being wound tangentially to said truncation planes so as to leave interstitial spaces between adjacent turns at the outer periphery of said conical flanks, in which spaces said block of rigid plastic foam is left uncovered by said elongate members (see figures and page 10 lines 10-17)

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Nevil to use elongate flexible members to stiffen a diaphragm with the frusto-conical diaphragm of James to provide a stiff, easy to manufacture and lightweight diaphragm to enhance sound reproduction.

James in view of Nevil does not disclose wherein the elongate members are themselves stiffened by a stiffening composition.

Guenther discloses the use of elongate stiffening members which are flexible and stiffened by a stiffening composition in the production of a speaker diaphragm (abstract).



At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Guenter to use elongate flexible members stiffened by a stiffening matrix to provide a greater degree of stiffness to the diaphragm of James as modified.

James as modified does not disclose expressly the monofilaments being paraphenylene polybenzobisoxazole, However it would have been obvious to one of ordinary skill in the art to select such a polymer, as it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

With respect to claim 43 While not expressly disclosed it would have been obvious to one of ordinary skill in the art to select the materials such that the ratio of masses was approximately 16. See Holdings of In re Leshin.

With respect to claim 44 Examiner considers that as Nevlin (page 10 lines 10-17) discloses about 400 turns one of ordinary skill in the art would consider this to include such numbers of turns as 399.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1,7-8,12,15,21,23-26,33-39,41-45 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FORREST M. PHILLIPS whose telephone number is (571)272-9020. The examiner can normally be reached on Monday through Friday 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on 5712721988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FP  
/Lincoln Donovan/  
Supervisory Patent Examiner, Art Unit 2837